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BODY TREATMENT PRODUCT

This invention relates to body treatment products, and in particular to devices for toning and massaging the muscles, especially the facial muscles.

It has been established that if a person's muscles are exercised, those muscles will grow and increase in strength, or at least any tendency to reduce in size and lose strength is minimised. Such exercising tones the muscles and reduces muscle tension. On that basis, if the facial muscles just below the surface of the skin can be suitably exercised or stimulated, then they can be strengthened and the growth of muscle mass will be encouraged. This can be a significant factor in maintaining, as a person ages, a taut, smooth-looking skin with a minimum of lines and wrinkles. This is a much sought after objective, particularly in the facial area, on which a great deal of time and money is spent within the beauty industry.

There are many known techniques and devices available which purport to achieve at least some measure of success in achieving these objectives. Surgical techniques are intrusive, can be painful and are generally very costly. Non-surgical techniques and the various known devices for performing them often have associated problems and very unpredictable results. Such devices are intended to tone and massage the muscles and are known as muscle stimulators. One such device for stimulating the facial muscles which is intended to achieve the above objective without many of the problems associated with the other techniques and devices is described in GB-2234965A. The muscle restructuring system device described in GB 2234965A applies a train of electrical pulses to the skin at a frequency which activates muscle contraction. For toning purposes, the pulses are mono-phase square waves at a voltage of 0 to 80 volts at a frequency of 20 to 80 Hz with a pulse length of 200 to 600 μ secs. For massage, this output, at a constant 15 Hz, is superimposed on a notional slow sine wave at a frequency of about 0.3 Hz at a voltage of 0 to 15 volts. The facial probes and pads are connected by electrical leads to a control unit for varying the pulse strength, frequency and duration. Such a device and the other known muscle stimulator devices are more particularly suited to salon use although attempts have been made to adapt the device for home use. In either case, several pads and probes have to be attached to the skin, for example by taping. For this reason, and because of the relatively cumbersome control unit and the existence of the multitude of leads to the facial probes and pads, it is necessary that the person being treated remains seated throughout the period of treatment. This may be up to 30 minutes at a time. Furthermore, there is a tendency for the leads to become entangled, which can result in one or more probes or pads becoming detached from the face.

Another device is described in US-A.3762396. In this case electrical pulses are applied to a patient's face through electrodes attached to a headband worn by the patient. At the same time, through headphones, the patient can receive an audio signal from an audio system. However, the system is only suitable for surgery or hospital use since the patient is obliged to remain in a fixed position near to the audio system throughout the period of treatment, and is not in control of the electrical pulses or the audio signal.

The objects of the present invention are to provide a body treatment product adapted to stimulate the muscles which avoids, at least to a significant extent, the problems associated with the known devices and one which is equally suitable for home or salon use. It is a further object of the present invention to provide a muscle stimulator which allows the user more easily to pursue other activities during its use than is the case with known devices.

The invention provides a body treatment product for applying electrical pulses to the skin, having at least one body contactor operable to apply electrical pulses to the body of a person being treated, a body unit adapted to be worn on the person and which supports the at least one body contactor, an audio system operable to provide an output signal, a control unit operable to receive the output signal, provide a corresponding signal and control the characteristics of the electrical pulses, whereby a parameter of the electrical pulse is varied in response to the output signal from the audio system in accordance with the corresponding signal from the control unit. The body unit may be a head unit adapted to be worn on the head, in which case the body contactor may be a facial contactor. The body treatment product may have a plurality of body contactors, each of which is supported by the body unit. The body contactors may be pads or probes. Body contacting pads may have an adhesive body contacting surface. The pads may comprise an adhesive pad detachably connected to a mounting block. The adhesive pad may be connected to the mounting block by means of a 'press-stud' fixing.

Each body contactor may be supported by the body unit by means of a link. Each link may be pivotally attached to the body unit, and may be pivotally attached to a respective body contactor. Each link may be formed of a plurality of parts, each part pivotally attached to an adjacent part. Each link may be of a resilient material, and may be a polyethylene extrusion. Links on opposed sides of the body unit may be resiliently biased towards each other. Each link may be formed as a box section. Each body contactor may be slidable longitudinally of the respective link to which it is attached, and may have at least 10 mm, preferably up to 15

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mm, of sliding movement. The sides of the links and the mounting blocks may have co-operating tapers.

The control unit may be operable to control the electrical pulses applied by the body contactors remotely, preferably by means of an infra-red signal. A signal receiving device may be mounted on the body unit. The signal receiving device may vary a parameter of the electrical pulse in response to the output signal from the audio system on receiving a corresponding signal from the control unit. The signal receiving device may increment a parameter of the electrical pulse by a predetermined amount on receiving a signal from the control unit. The control unit may be operable to control the strength, frequency and/or the duration of the electrical pulses, and may control which body contactors are active. The pulse voltage may be between 50 and 25 volts. The control unit may be adapted to be worn by the person being treated, and may be adapted to be worn on the wrist of the person. The control unit may comprise a watch, which may have a stop watch and/or a timer function. Alternatively the control unit may comprise a computer, which may operate in response to a program on a disc. The control unit may have a re-use delay function. The control unit may be electrically connected to a power unit, and the power unit may be adapted to be worn by the person. The power unit may be adapted to be worn on the belt of the person.

The body unit may comprise headphones. The audio device may be connected to the headphones, and the audio device may be a radio and/or a tape or disc player. The audio device may be adapted to be worn on a belt of the person. The control unit may be operable to control the volume and the operating mode of the audio device, e.g. radio/cassette, radio programme. The audio system output signal may be used to control the strength, frequency, waveform and/or the duration of the electrical pulses, which may be in synchronisation with audio system output signal for an enhanced effect of the facial stimulation.

The invention will now be further described with reference to the accompanying drawings in which:

- Fig. 1 is an illustration of one embodiment,
- Fig. 2 is an enlarged view of an arm of the product of Fig. 1,
- Fig. 3 is a scrap section of the arm of Fig. 2, and
- Fig. 4 is a schematic of the control system

Referring now to Fig 1 there is shown a muscle stimulator 10 which has a head unit 11 consisting of a resilient head band 12 which is worn over the head of a person undergoing treatment with the muscle stimulator 10 in the manner of headphones or a personal stereo

radio/cassette player. To each end of the head band 12 is attached an ear pad 13 and one end of a link 14. At the other end of each link 14 is a facial contactor 15, which may be in the form of an adhesive pad which is about 10 mm square, or a probe. Also attached to one end of the head band 12 is an infra-red signal receiver 16 which is individually electrically connected to the pads or probes 15. An electrical lead 17 connects the receiver 16 with a battery pack power unit 18. The battery pack unit 18 has a clip 19 by means of which it may be worn on a belt around the person's waist. A control unit 20 which is adapted to be worn on the person's wrist is combined with a watch 21, preferably having a stop watch and/or timer function, for example 5 min countdown for muscle stimulation, 15 min for massage. The control unit 20 generates infra-red signals which are received by the signal receiver 16. Another lead 22 may be connected to the battery pack power unit 18 to provide power to motor point/massage heads (not shown), and an audio lead 23 may be connected to a personal stereo radio/cassette player 40 (Fig. 4).

One of the links 14 is shown in greater detail in Fig. 2. In this case, each link 14 consists of two parts, a primary link 24 and a secondary link 25 which are articulated to each other at a joint 26 so that relative movement of up to 180° can take place as shown by arrow A. Such relative positioning may be continuously variable or there may be co-operating formations in the joint 26 to provide pre-set relative positioning at, for example, every 10° within the range of movement. The primary link 24 is similarly rotatably attached to the signal receiver 16, ear pad 13 and head band 12, so as to be positionally adjustable relative thereto as shown by arrow B. A face contacting adhesive pad 15 is mounted on the secondary link 25, and a second face contacting adhesive pad 27 may be mounted on the primary link 24. These pads 15, 27 are slidable along the respective links 24, 25 as shown by arrows C, and as shown in greater detail in Fig. 3. The links 24, 25 are of T-shaped box form in cross-section and are mounted and shaped such that the pads 15 must be moved apart from each other in order to place them on the face. The links 24, 25 are preferably made from a polyethylene extrusion to provide springiness to grip the person's face. Alternatively or in addition the links 24 may be resiliently biased towards each other by means of springs 41. The outer part 28 of the T-section provides a trough for the electrical wires 36 (Fig. 4) from the receiver 16 to the pads 15, 27. On the inner face of the links 24, 25 is a slot 29 through which the T-shaped mounting block 30 protrudes so that the mounting block 30 can slide longitudinally of the link 24, 25. Each pad 15, 27 is removably attached to its mounting block 30 by means of a 'press-stud' attachment 31 which also has concentric electrical contacts 32, 33. The sides of the slot 29 and the protruding part of the mounting block 30 are correspondingly tapered. Pushing the link 24, 25 and the pad 15, 27 together has the effect of locating the mounting block 30 in the link 24, 25, whilst pulling the link 24, 25 and pad 15, 27 in the opposite direction releases the

mounting block 30 from the slot 29 to allow the pad 15, 27 to be moved along the link 24, 25. The travel of the pads 15, 27 along the links 24, 25 may be up to 15 mm. By moving the pads 15, 27 along the links 24, 25 and swivelling the links 24, 25 relative to each other and the head unit 11 allows the person to position the pads 15, 27 at the desired places on the face. By pulling the links 14 apart, thereby releasing the links 14 from the pads 15, 27, the head unit 11 and links 14 can be removed from the head, and the pads 15, 27 can then be removed from the face individually.

Referring now to Fig. 4, the power unit 18 comprises a battery pack 34 and a pulse generator 35 to which it is connected. The generated pulses pass along the lead 17 to the receiver 16 on the head unit 11. From the receiver 16 the pulses are relayed to the pads 15, 27 via the wires 36. The controls 37 (Fig. 1) of the control unit 20 create a first infra-red (IR) or hard wired link 38 to the pulse generator 35 to select the type of treatment, i.e. toning or massage, and control the frequency and strength of the pulses. The control unit 20 may be the above described watch device 21 or may be a computer, which operates in response to a program on a disc. With little pressure between the pads 27 and the person's face, 50 volt pulses are required to provide effective stimulation. However, with sufficient pressure between the pads 27 and the face as provided by the resilience of the links 24, 25 and/or the springs 41, the pulse voltage may be reduced to 25 volts for satisfactory stimulation. A second IR link 39 to the receiver 16 or hard wired link via the power unit 18, is provided to control which pads 15, 27 are active. The watch 21 or computer 20 may also display the chosen settings. An audio unit 40, e.g. a personal radio/cassette player may be connected to the pack 18 by audio lead 23, or the computer 20 may be used, so that the output of the audio unit 40 or the sound card of the computer 20 can be relayed to the head unit 11 and the ear pad 13 via combined lead 17, thereby allowing the person to listen to the audio unit 40 or music played by computer 20 whilst being massaged, and also restricting the number of leads to the head unit 11. Control of the audio unit 40 may be by controls on the unit itself, and/or by the controls 37 of the controller 20. In addition, the output from the audio system 40 or computer 20 when received by the control unit 18 may be used to control the electrical pulses applied by the pads 15, 27 in response to and either in or out of synchronisation with that output signal as desired. The signal receiving device 16 may vary a parameter of the electrical pulse in response to the output signal from the audio system 40 or computer 20 on receiving a corresponding signal from the control unit 18. The output signal from the audio system 40 or computer 20 may be used to control the strength, frequency, waveform and/or the duration of the electrical pulses applied to the person by the pads 15, 27.

By means of the invention a facial muscle stimulator is provided which is convenient for home as well as for salon use. The person undergoing treatment can move around during the treatment and perform other activities such as domestic chores, using exercise apparatus, walking, travelling by vehicle or the like. The person can also listen to music, exercise instructions or other radio programme, and when music is listened to, the facial stimulation may be in synchronisation with the music for an enhanced effect. At all times the person has the facility to control the stimulation or massage applied, thereby reducing the risk of excess stimulation or overuse.

Other embodiments of apparatus within the scope of the invention will be readily apparent to persons skilled in the art. For example the links 14 may comprise one part or more than two mutually articulated parts. The audio unit 40 may be combined with the power unit 18, and/or may comprise a mini-disc player. Instead of the belt clip 19, a belt or strap may be attached to the battery pack 18. The sides of the box section of the links 24, 25 may be tapered to co-operate with the tapered sides of the enclosed part of the mounting blocks 30 instead of the sides of the slot 29 and the protruding part. The head unit 11 may comprise a hat, for example a baseball cap, instead of the head band 12. Although a facial muscle stimulator 10 is illustrated and described, the apparatus could be adapted for stimulation of other muscles of the body, the head unit 11 being replaced by a body unit adapted to be worn by the person about some other part of his/her body, e.g. around the waist for toning/massaging tummy muscles.

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